

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

Listing of Claims:

1. (Currently Amended) A friction stir welding apparatus for joining members of a work by inserting a rotating tool into the work and moving the rotating tool relative to the work, comprising a controller for controlling a relative distance in a tool insertion direction between the tool and the work ~~or~~ and an insertion depth of the tool into the work so that a load factor or electric current of a spindle motor for rotating the tool is within a predetermined range, and support structure for the rotating tool such that when the rotating tool is inserted into the work the rotating tool is tilted at a predetermined angle θ to the work toward a rear side with respect to a direction of moving the rotating tool relative to the work.

2. (Currently Amended) A friction stir welding apparatus according to claim 1, further comprising a laser displacement meter or a contact type displacement meter for detecting the relative distance in a tool insertion direction between the tool and the work during the joining operation ~~or~~ and the insertion depth of the tool into the work, the detected values being reflected on the controller.

3. (Currently Amended) A friction stir welding apparatus for joining members of a work by inserting a rotating tool, rotated by a spindle motor, into the

work and moving the rotating tool relative to the work, comprising a controller for controlling a relative distance in a tool insertion direction between the tool and the work ~~or~~ and an insertion depth of the tool into the work so that a load factor or electric current of the spindle motor is within a predetermined range, and support structure for the rotating tool such that when the rotating tool is inserted into the work the rotating tool is tilted at a predetermined angle θ to the work toward a rear side with respect to a direction of moving the rotating tool relative to the work.

4. (Currently Amended) A friction stir welding apparatus according to claim 3, further comprising a laser displacement meter or a contact type displacement meter for detecting the relative distance in a tool insertion direction between the tool and the work during the joining operation ~~or~~ and the insertion depth of the tool into the work, the detected values being reflected on the controller.

5. (Currently Amended) A friction stir welding method of joining members of a work, ~~by comprising:~~
 _____ inserting a rotating tool into the work and moving the rotating tool relative to the work, wherein the inserted rotating tool is tilted at a predetermined angle θ to the work toward a rear side with respect to a direction of movement of the rotating tool relative to the work; and
 _____ ~~comprising the step of~~ controlling a relative distance in a tool insertion direction between the tool and the work during the joining operation ~~or~~ and an insertion depth of the tool into the work so that a load factor or electric current of a

spindle motor for rotating the tool is within a predetermined range.

6. (Currently Amended) A friction stir welding method according to claim 5, wherein the relative distance in a tool insertion direction between the tool and the work during the joining operation ~~or~~ and the insertion depth of the tool into the work is detected by a laser displacement meter or a contact type displacement meter, and the detected values are reflected on the controller.

7. (New) A friction stir welding apparatus according to claim 1, wherein said rotating tool has a first portion which first enters the work when the rotating tool is inserted into the work and a second portion coaxial with the first portion, the second portion having a larger diameter than the first portion, a shoulder being provided between the first and second portions, and wherein the support structure supports the rotating tool such that when the rotating tool is inserted in the work a front part of the shoulder, in the direction of movement of the rotating tool relative to the work, is not inserted in the work, and a rear part of the shoulder, in the direction of movement of the rotating tool relative to the work, is inserted in the work.

8. (New) A friction stir welding apparatus according to claim 3, wherein said rotating tool has a first portion which first enters the work when the rotating tool is inserted into the work and a second portion coaxial with the first portion, the second portion having a larger diameter than the first portion, a shoulder being provided between the first and second portions, and wherein the support structure

supports the rotating tool such that when the rotating tool is inserted in the work a front part of the shoulder, in the direction of movement of the rotating tool relative to the work, is not inserted in the work, and a rear part of the shoulder, in the direction of movement of the rotating tool relative to the work, is inserted in the work.

9. (New) A friction stir welding method according to claim 5, wherein said rotating tool has a first portion which first enters the work when the rotating tool is inserted into the work and a second portion coaxial with the first portion, the second portion having a larger diameter than the first portion, a shoulder being provided between the first and second portions, and wherein, when the rotating tool is inserted in the work, a front part of the shoulder, in the direction of movement of the rotating tool relative to the work, is not inserted in the work, and a rear part of the shoulder, in the direction of movement of the rotating tool relative to the work, is inserted in the work.